

DIRECT TESTIMONY AND EXHIBITS OF

BRANDON S. BICKLEY

ON BEHALF OF

THE SOUTH CAROLINA OFFICE OF REGULATORY STAFF

DOCKET NO. 2022-2-E

Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS AND OCCUPATION.

A. My name is Brandon S. Bickley. My business address is 1401 Main Street, Suite 900, Columbia, South Carolina 29201. I am employed by the State of South Carolina as a Regulatory Manager for the Office of Regulatory Staff ("ORS").

Q. PLEASE STATE YOUR EDUCATIONAL BACKGROUND AND EXPERIENCE.

A. I received my Bachelor of Science Degree with a major in Mechanical Engineering from the University of South Carolina in 2010. From 2010 to 2013, I was employed as a Nuclear Engineer, Reactor Fuel Safety Officer, and Shift Refueling Engineer at Norfolk Naval Shipyard. In that capacity, I performed engineering and operational duties in support of the United States Navy related to reactor servicing, reactor fuel, special nuclear material, special nuclear projects, security, and safety. From 2013 to 2017, I was employed as an Inspections, Tests, Analyses, and Acceptance Criteria ("ITAAC") Engineer with South Carolina Electric & Gas Company ("SCE&G"). In that capacity, I obtained the level of a Senior Engineer and performed ITAAC reviews and construction oversight for SCE&G. From 2017 to 2019, I was employed by Savannah River Remediation as a Senior Engineer. In that capacity, I performed systems engineering duties in support of the Defense Waste Processing Facility for Savannah River Remediation. I began my employment with ORS

as a Regulatory Analyst in July of 2019. In January of 2022, I was promoted to my current position of Regulatory Manager in the Energy Operations Division.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE PUBLIC SERVICE COMMISSION OF SOUTH CAROLINA (“COMMISSION”)?

A. Yes. I have previously testified before the Commission on several occasions including annual fuel proceedings, general rate cases, and a proceeding related to the Utility Facility Siting and Environmental Protection Act.

Q. WHAT IS THE MISSION OF ORS?

A. ORS represents the public interest as defined by the South Carolina General Assembly in S.C. Code Ann. § 58-4-10 as:

[T]he concerns of the using and consuming public with respect to public utility services, regardless of the class of customer, and preservation of continued investment in and maintenance of utility facilities so as to provide reliable and high-quality utility services.

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY IN THIS PROCEEDING AND HOW DOES YOUR DIRECT TESTIMONY REPRESENT THE PUBLIC INTEREST?

A. The purpose of my direct testimony is to set forth ORS’s recommendations resulting from ORS’s examination and review of Dominion Energy South Carolina, Inc.’s (“DESC” or the “Company”) power plant operations used in the generation of electricity to meet the Company’s South Carolina retail customer requirements during the review period. The review period includes the actual data for January 2021 through December 2021 (“Actual Period”), estimated data for January 2022 through April 2022 (“Estimated Period”), and forecasted data for May 2022 through April 2023 (“Forecasted Period”). My review focused on ensuring the Company efficiently operated its plants and made every

reasonable effort to minimize fuel costs so as to provide reliable and high-quality service to its customers.

Q. WAS THE REVIEW TO WHICH YOU TESTIFY PERFORMED BY YOU OR UNDER YOUR SUPERVISION?

A. Yes, the review to which I testify was performed by me or under my supervision.

Q. PLEASE DESCRIBE ORS'S REVIEW OF THE COMPANY'S PLANT OPERATIONS.

A. ORS examined various fuel and performance documents related to the Company's electric generation and power plant outage and maintenance activities. ORS analyzed DESC's monthly fuel reports including power plant performance data, unit outages, heat rate data, and generation statistics. ORS also monitored electric generation statistics through industry and governmental publications.

ORS attended, via virtual participation, the April 22, 2021, Nuclear Regulatory Commission's ("NRC") 2020 Annual Assessment meeting for the V.C. Summer Nuclear Station ("V.C. Summer"). Additionally, ORS met, via virtual participation, with Company personnel from various departments to discuss and review the Company's electric generation, power plant outages, and maintenance activities. ORS also conducted on-site visits of the Wateree Station in Eastover, South Carolina, the Columbia Energy Center in Gaston, South Carolina, and the Coit Station in Columbia, South Carolina during the Actual Period.

Q. DID ORS EXAMINE THE COMPANY'S PLANT OPERATIONS FOR THE ACTUAL PERIOD?

1 A. Yes. ORS reviewed the performance of DESC's generation units to determine if
2 the Company made reasonable efforts to maximize unit availability and every reasonable
3 effort to minimize fuel costs. ORS also reviewed the operating statistics of the Company's
4 power plants by unit. Exhibit BSB-1 shows, in percentages, the average availability,
5 average net capacity, and average forced outage factors of the Company's major generation
6 units during the Actual Period. Exhibit BSB-1 also includes the North American Electric
7 Reliability Corporation ("NERC") national five-year (2016-2020) averages for
8 availability, capacity, and forced outage factors for each type of generation plant.

9 **Q. PLEASE EXPLAIN HOW OUTAGES ARE REPRESENTED ON EXHIBITS BSB-**
10 **2 THROUGH BSB-4.**

11 A. Exhibits BSB-2 and BSB-3 summarize outages lasting seven (7) or more days for
12 major coal and natural gas units, respectively, during the Actual Period. While not all plant
13 outages are included in these exhibits, all outages were reviewed. ORS reviewed the
14 outages, including information and data provided by the Company in testimony and
15 discovery, and discussed the outages with DESC management responsible for plant
16 operations. ORS found the outages to be reasonable based on ORS's review of the outage
17 data from the Actual Period, forecasted outage data from Docket No. 2021-2-E, historical
18 outage data from previous annual fuel proceedings, and industry experience. Plant outages
19 that are not complete at the end of the Actual Period and plant outages where final reports
20 are not available will be reviewed by ORS for reasonableness of the outages and associated
21 fuel related costs in the review period during which the outage is completed or when the
22 reports become available. For this review period, the Wateree Unit 2 forced outage

1 regarding the generator repair and replacement work is still ongoing and has not been
2 completed yet. Therefore, ORS will review this outage during the next fuel proceeding.

3 Exhibit BSB-4 shows the duration, type, and cause of each outage for V.C. Summer
4 during the Actual Period. There were three (3) separate outages involving V.C. Summer,
5 including one (1) scheduled refueling outage and two (2) forced outages. ORS reviewed
6 the outages, including information and data provided by the Company in testimony and
7 discovery as well as associated NRC documents, and discussed the outages with DESC
8 management responsible for plant operations. ORS found the outages that were reviewed
9 to be reasonable based on ORS's review of the outage data from the Actual Period,
10 forecasted outage data from Docket No. 2021-2-E, historical outage data from previous
11 annual fuel proceedings, and industry experience. Plant outages that are not complete at
12 the end of the Actual Period and plant outages where final reports are not available will be
13 reviewed by ORS for reasonableness of the outages and associated fuel related costs in the
14 review period during which the outage is completed or when the reports become available.
15 For this review period, the causal analysis and related insurance reviews are still ongoing
16 for the V.C. Summer forced outage that occurred on November 15, 2021 (main generator
17 step-up transformer). Therefore, ORS will review this outage during the next fuel
18 proceeding.

19 **Q. WHAT WERE THE RESULTS OF ORS'S ANALYSIS OF THE COMPANY'S**
20 **POWER PLANT OPERATIONS FOR THE ACTUAL PERIOD?**

21 A. Based on ORS's review of the Company's operation of its generation facilities
22 during the Actual Period, ORS determined that the Company made reasonable efforts to
23 maximize unit availability and every reasonable effort to minimize fuel costs.

Q. DID ORS REVIEW THE COMPANY'S GENERATION MIX DURING THE ACTUAL PERIOD?

A. Yes. Exhibit BSB-5 shows the generation mix for the Actual Period by percentage and generation type. As shown in this exhibit, the nuclear, coal, and natural gas plants contributed an average of approximately 19.26%, 19.44%, and 47.23%, respectively, of the Company's generation throughout the Actual Period. This equates to approximately 85.93% of the Company's generation for the Actual Period. The remainder of the generation was met through a mix of hydroelectric, owned and purchased solar, and other purchased power.

Q. DID ORS REVIEW THE COMPANY'S FUEL COSTS ON A PLANT-BY-PLANT BASIS FOR THE ACTUAL PERIOD?

A. Yes. Exhibit BSB-6 shows the average fuel costs for the major generation plants on the Company's system for the Actual Period and the megawatt-hours ("MWh") produced by those plants. The exhibit shows the lowest average fuel cost of 0.720 cents/kilowatt-hour ("kWh") at V.C. Summer and the highest average fuel cost of 5.505 cents/kWh at the McMeekin Station. The Company utilizes economic dispatch which generally requires the lower cost units to be dispatched first.

Q. DID ORS REVIEW THE COMPANY'S FORECASTED POWER PLANT OPERATIONS FOR THE ESTIMATED AND FORECASTED PERIODS?

A. Yes. ORS reviewed DESC's maintenance schedules and projected performance data for its power plants for the Estimated and Forecasted Periods including the updated data and information provided in the Company's Direct Testimony. ORS compared the maintenance schedules and performance data to previous data and information from

Docket No. 2021-2-E, maintenance schedules and performance data from the Actual Period, and historical projections from previous annual fuel proceedings. Based on its review, ORS found the Company's maintenance schedules and projected data for its power plants for the Estimated and Forecasted Periods to be reasonable.

Q. DOES ORS RECOMMEND ANY ADJUSTMENTS TO THE FUEL FACTORS PROPOSED BY DESC BASED ON DESC'S POWER PLANT OPERATIONS?

A. No. ORS does not recommend any adjustments to the Fuel Factors based on the Company's power plant operations.

Q. WILL YOU UPDATE YOUR DIRECT TESTIMONY BASED ON INFORMATION THAT BECOMES AVAILABLE?

A. Yes. ORS fully reserves the right to revise its recommendations via supplemental testimony should new information not previously provided by the Company, or other sources, becomes available.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

Office of Regulatory Staff
Power Plant Performance Data
Dominion Energy South Carolina, Incorporated
Docket No. 2022-2-E

EXHIBIT BSB-1

Plant	Unit	MW Rating	Actual Period Data		
			Average Availability Factor (%)	Average Net Capacity Factor (%)	Average Forced Outage Factor (%)
Cope		415	92.53	43.87	0.26
Wateree	1	342	81.48	50.36	0.36
Wateree	2	342	0.00	0.00	100.00
Williams		605	72.23	45.75	0.08
Coal Totals		1,704	61.56	46.33	25.18
NERC 5-year average (All Coal Plants)			82.29	49.73	5.26
McMeekin	1	125	82.19	40.21	0.00
McMeekin	2	125	87.90	42.93	0.06
Urquhart	3	95	92.13	11.05	0.01
Natural Gas Totals		345	87.41	33.14	0.02
NERC 5-year average (Natural Gas Plants)			80.22	12.77	5.46
Columbia Energy Center	1	142	86.15	73.30	8.02
Columbia Energy Center	2	142	73.03	55.96	7.88
Columbia Energy Center	3	235	88.65	44.24	7.59
Jasper	1	156	86.27	70.56	0.00
Jasper	2	164	81.71	67.32	0.14
Jasper	3	158	78.63	68.11	0.03
Jasper	4	385	88.28	52.48	0.00
Urquhart	1	64	96.62	63.79	0.80
Urquhart	2	64	81.15	53.35	4.33
Urquhart	5	162	96.73	53.16	0.76
Urquhart	6	168	81.53	44.74	4.09
CC ¹ Totals		1,840	85.34	57.35	3.06
NERC 5-year average (CC Plants)			88.04	54.25	2.36
V.C. Summer	1 ²	966	82.46	82.69	8.36
Nuclear Totals		966	82.46	82.69	8.36
NERC 5-year average (All Nuclear Plants)			92.72	91.71	1.63

¹ CC designates Combined-Cycle units

² V.C. Summer Unit Ownership: DESC (66.7%, ≈644 MW) and South Carolina Public Service Authority (33.3%, ≈322 MW)

Office of Regulatory Staff
Coal Unit Outages - 7 Days or Greater Duration
Dominion Energy South Carolina, Incorporated
Docket No. 2022-2-E

Unit	Date Offline	Date Online	Hours	Outage Type	Explanation of Outage
Cope Unit 1	5/12/21	5/26/21	335.1	Planned	Unit taken offline for planned Spring outage
Wateree Unit 1	5/1/21	5/22/21	504.0	Planned	Unit taken offline for planned Spring outage
Wateree Unit 1	5/22/21	6/18/21	648.6	Extension	Extension of planned Spring outage
Wateree Unit 2	2/19/20	Repairs ongoing	N/A	Forced	Unit forced offline due to the generator out of service
Williams Unit 1	3/21/21	5/9/21	1,188.5	Planned	Unit taken offline for planned Spring outage
Williams Unit 1	8/28/21	10/4/21	894.2	Planned	Unit taken offline for planned Fall outage
Williams Unit 1	12/6/21	12/14/21	202.0	Planned	Unit taken offline for planned Fall outage

Office of Regulatory Staff
Natural Gas Unit Outages - 7 Days or Greater Duration
Dominion Energy South Carolina, Incorporated
Docket No. 2022-2-E

Unit	Date Offline	Date Online	Hours	Outage Type	Explanation of Outage
Columbia Energy Unit 1	3/18/21	4/4/21	397.4	Planned	Unit taken offline for planned Spring outage
Columbia Energy Unit 1	10/12/21	11/11/21	717.7	Forced	Unit forced offline due to Boiler Chemistry and Circulating Water Pump #2 Failure
Columbia Energy Unit 2	3/29/21	4/16/21	438.8	Planned	Unit taken offline for planned Spring outage
Columbia Energy Unit 2	5/5/21	5/31/21	648.0	Maintenance	Maintenance outage to perform corrective maintenance on main generator
Columbia Energy Unit 2	6/1/21	6/14/21	326.6	Extension	Extension of Maintenance outage.
Columbia Energy Unit 2 ¹	10/12/21	11/13/21	753.5	Forced	Unit forced offline due to Boiler Chemistry and Circulating Water Pump #2 Failure
Columbia Energy Unit 3	3/29/21	4/5/21	187.4	Planned	Unit taken offline for planned Spring outage
Columbia Energy Unit 3 ¹	10/12/21	11/12/21	742.7	Forced	Unit forced offline due to Boiler Chemistry and Circulating Water Pump #2 Failure
Jasper Unit 1	10/16/21	11/20/21	829.4	Planned	Unit taken offline for planned Fall outage
Jasper Unit 2	10/16/21	12/7/21	1,236.6	Planned	Unit taken offline due to GT2 Major Generator Inspection
Jasper Unit 3	3/7/21	4/17/21	991.3	Planned	Unit taken offline for planned Spring outage
Jasper Unit 3	10/16/21	11/19/21	806.2	Planned	Unit taken offline for planned Fall outage
Jasper Unit 4	10/16/21	11/20/21	833.4	Planned	Unit taken offline for planned Fall outage
McMeekin Unit 1	4/4/21	5/5/21	746.5	Planned	Unit taken offline for planned Spring outage

Office of Regulatory Staff
Natural Gas Unit Outages - 7 Days or Greater Duration
Dominion Energy South Carolina, Incorporated
Docket No. 2022-2-E

EXHIBIT BSB-3

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Unit	Date Offline	Date Online	Hours	Outage Type	Explanation of Outage
McMeekin Unit 1	5/30/21	6/18/21	454.0	Maintenance	Maintenance outage to repair #4 admission valve on main steam turbine
McMeekin Unit 1	8/23/21	8/31/21	200.0	Planned	Unit taken offline for planned Fall outage
McMeekin Unit 2	4/15/21	5/23/21	908.4	Planned	Unit taken offline for planned Spring outage
Urquhart Unit 2	4/15/21	5/25/21	959.5	Planned	Unit taken offline for planned Spring outage
Urquhart Unit 2	12/18/21	1/3/22	388.1	Forced	Unit forced offline due to UGT6 Combustion Cans 5 and 6 liner issues
Urquhart Unit 3	3/21/21	4/1/21	272.0	Planned	Unit taken offline for planned Spring outage
Urquhart Unit 3	8/21/21	9/7/21	416.5	Planned	Unit taken offline to rebuild the "A" circulating water pump motor and repair of a seal oil regulator
Urquhart Unit 6	4/15/21	5/25/21	957.6	Planned	Unit taken offline for planned Spring outage
Urquhart Unit 6	12/18/21	1/3/22	386.8	Forced	Unit forced offline due to UGT6 Combustion Cans 5 and 6 liner issues

¹ Forced Outages for Columbia Energy Center Units 2 and 3 include Planned Outage work from 11/4/21 to 11/8/21 originally scheduled for Thanksgiving

Office of Regulatory Staff
Nuclear Unit Outages
Dominion Energy South Carolina, Incorporated
Docket No. 2022-2-E

EXHIBIT BSB-4

V.C. Summer Nuclear Station				
Date Offline	Date Online	Hours	Outage Type	Explanation of Outage
5/12/21	5/15/21	56.9	Forced	Unit was forced offline due to Accumulator air leak on Feedwater Isolation Valve
10/8/21	11/14/21	876.9	Planned	Unit was taken offline for planned refueling outage
11/15/21	12/10/21	602.3	Forced	Unit was forced offline due to a fault on the unit's main generator step-up transformer

Office of Regulatory Staff
Generation Mix (Percentage)
 Dominion Energy South Carolina, Incorporated
Docket No. 2022-2-E

EXHIBIT BSB-5

2021													
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Nuclear	24.16	23.48	27.57	27.71	22.64	21.55	19.86	19.41	22.58	5.85	0.32	15.03	19.26
Coal	26.25	33.05	17.56	10.66	11.87	18.68	23.57	22.08	8.01	15.95	30.89	12.97	19.44
Natural Gas	40.44	34.46	39.57	44.33	46.15	47.74	46.11	47.66	57.65	56.22	46.97	58.57	47.23
Hydroelectric	3.20	3.03	3.37	3.23	2.79	2.43	2.27	2.05	2.49	2.69	2.34	2.85	2.69
Solar (Owned and Purchased)	5.01	5.26	8.98	12.64	11.86	8.63	7.98	7.10	8.40	7.79	7.66	5.23	7.99
Wind	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Biomass	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Purchased Power	0.94	0.72	2.95	1.43	4.69	0.97	0.21	1.70	0.87	11.50	11.82	5.35	3.39

Numbers may not equal 100% due to rounding

Office of Regulatory Staff
Generation Statistics for Major Plants
Dominion Energy South Carolina, Incorporated
Docket No. 2022-2-E

EXHIBIT BSB-6

Plant	Fuel Type	Average Fuel Cost (¢/kWh) ¹	Generation (MWh)
V.C. Summer ²	Nuclear	0.720	4,664,737
Wateree	Coal	3.290	1,508,649
Columbia Energy Center	Natural Gas	3.318	2,667,873
Williams	Coal	3.445	2,433,667
Jasper CC	Natural Gas	3.595	4,747,395
Urquhart CC	Natural Gas	3.949	2,117,717
Cope	Coal/Natural Gas	3.977	1,594,795
Urquhart 3	Natural Gas	4.902	92,316
McMeekin	Natural Gas	5.505	920,356

¹ Includes Base Fuel and Environmental Costs

² Generation Statistics for V.C. Summer represent DESC's 66.7% ownership